AP/3641

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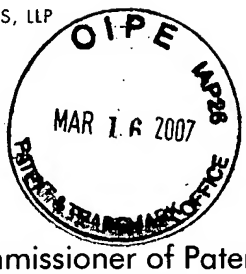

March 13, 2007

Commissioner of Patents
MAIL STOP APPEAL BRIEF - PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

Re: U.S. Patent Application Ser. No. 10/722,234
Applicant: David W. Herbage
Filed: November 25, 2003
For: Countermeasure System and Method of Using the Same
Docket No. A310429.1US

Dear Sir:

I hereby certify that the below listed items are being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Appeal Brief - Patents, Commissioner for Patents, P. O. Box 1450, Alexandria VA 22313-1450 on March 13, 2007.

1. Transmittal letter (1 page);
2. Response to Notice of Non-Compliant Appeal Brief and Resubmission of Appeal Brief, including Certificate of Mailing (24 pages); and
3. Firm return receipt post card.

Respectfully submitted,

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SOH/slb
Enclosures

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor/Applicant:	§	
	§	
David W. Herbage	§	
	§	
Filed: **November 25, 2003**	§	Art Unit: **3641**
	§	
Serial No.: **10/722,234**	§	Examiner: **Clement, Michelle Renee**
	§	
	§	Attorney Docket No.: **A310429.1US**

For: **Countermeasure System and Method of Using the Same**

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

RESPONSE TO NOTICE OF NON-COMPLIANT APPEAL BRIEF AND RESUBMISSION OF APPEAL BRIEF

Dear Sir:

In response to the Notification of Non-Compliant Appeal Brief mailed March 5, 2007, Applicant resubmits its Appeal Brief with corrections in support of the Appeal filed November 1, 2006 in the above-referenced application.

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REAL PARTY IN INTEREST

The real party in interest is Kilgore Flares Company, LLC, the assignee of record.

RELATED APPEALS AND INTERFERENCES

None.

STATUS OF CLAIMS

Claims 44 and 46 through 54 are under final rejection. Claims 1 through 10, 11 through 43, and 45 were previously canceled.

STATUS OF AMENDMENTS

An Amendment after final rejection was filed electronically on December 19, 2006 to comply with the Examiner's requirements of form and present the rejected claims in better form on appeal. In an advisory action mailed January 18, 2007, Examiner refused to enter the proposed Amendment and claims 44, 46-54 remain rejected.

SUMMARY OF CLAIMED SUBJECT MATTER

A number of devices have been employed on naval ships for protection from, among other threats, anti-ship missiles. These anti-ship missiles exhibit a wide variety of missile technologies, including infrared seeking and radar guidance technologies. Various countermeasure systems have been employed in naval ships to protect against these anti-ship missiles. For example, by providing false signals to confuse guidance and/or fire control systems of the anti-ship's missiles. Conventional countermeasure systems are generally mounted on the ship's main deck. Generally, the launchers and the countermeasure cartridges themselves add to the profile of the ship. The design orientation and location of these conventional launchers at least generally increases both the radar cross section and the visual outline of the ship. [*See* p.1, l. 18 through p. 2, l. 14].

Due to developments in ship detecting systems, new combat ships are preferably being configured to avoid detection. In order to achieve a stealthy profile, new ships will ideally be low in the water, have sloped sides, and have no unnecessary protrusions above the main deck. [*See* p. 2, ll. 15-21]. The present invention provides a countermeasure system that promotes a stealthy characteristic of a marine vessel and is space efficient. [p. 3, 11. 5-7]. Applicant's countermeasure system 12 is located at least generally below the main deck 18 of the marine vessel 10. [Figure 1; p. 11, ll. 10-11]. One beneficial feature of the below-deck location of the countermeasure system 12 is that such an arrangement reduces the radar cross section relative to locations of conventional above-deck countermeasure systems, thus promoting a desired stealthy profile of the marine vessel 10. [p. 12, ll. 1-4].

Applicant's countermeasure system is capable of effecting launch and deployment from one or more substantially vertical launch tubes. The countermeasure system may launch, deploy and/or control a countermeasure using at least a predetermined parameter relating to one or more of time, altitude, attitude (e.g. azimuth), location and distance to enhance protection of the intended marine vessel. [p. 3, ll. 5-13].

The launcher assembly 20 of the present invention includes a launch tube 24 and an imaginary reference axis 26 that extends along a length 28 of the launch tube 24. [Figure 2]. One inventive feature of the present invention is that the launcher assembly 20 is located below the ship's deck. Thus the invention has no parts that protrude that would add to the profile of the ship and make it more susceptible to current detection technology. This feature necessitates the vertical arrangement of the launch tube 24. [*See* p. 2, ll. 15-21] This reference axis 26 and, accordingly, the length 28 of the launch tube 24 are preferably fixed in a substantially vertical orientation. This vertical orientation provides the benefit of the launcher assembly 20 occupying

an at least generally reduced amount of lateral space on the marine vessel 10 relative to conventional countermeasure systems. In addition to the launch tube 24, the launcher assembly 20 includes an outer tube 25. At least a portion of the launch tube 24 is disposed within this outer tube 25. Moreover, the reference axis 26 extends along the length 30 of the outer tube 25 as well as the length 28 of the launch tube 24. [p. 12, l. 19 - p. 13, l. 5].

The launch tube 24 at least generally rotates about the reference axis 26. [Figure 2]. Since the outer tube 25 is substantially immobile relative to the base 22, another characterization of the launch tube 24 is that the launch tube 24 is rotatable or at least movable relative to the outer tube 25. Herein rotatable generally refers to a capability to at least generally spin or turn around or about an axis or a center. [p. 14, ll. 12-18]. The countermeasure system may include an outer tube. At least a portion of the launch tube is preferably disposed within this outer tube. Moreover, the reference axis preferably extends along the length of the outer tube as well as the length of the launch tube. [p. 4, ll. 11-14].

Applicant's invention includes a countermeasure cartridge 50 which is at least generally disposable in the launch tube 24 of the launcher assembly 20. [Figure 3]. All or part of the countermeasure cartridge 50 is positionable within the launch tube 24 prior to the launch of the cartridge 50 therefrom. This cartridge 50 includes a nose 51 and an opposing tail 53. In addition, toward the tail 53, the cartridge includes at least one propulsion module 52 (e.g. rocket motor, impulse assembly, mortar assembly and/or the like). This propulsion module 52 is generally disposed between the nose 51 and a secondary firing coil 58 associated with the tail 53 of the countermeasure cartridge 50. Located between the secondary firing coil 58 and the propulsion module 52 is a fin cup 60 equipped with a plurality of spring-loaded fins 57a, 57b. [p. 15, ll. 12-20]. The countermeasure cartridge 50 also includes at least one payload section 54

between the propulsion module 52 and the nose 51 for at least temporarily containing one or more appropriate decoys 54' such as, but not limited to, infrared and/or radar reflecting decoys. [p. 16, ll. 14-17].

The countermeasure cartridge may also be equipped with one or more canards or spring-loaded fins, toward the aft end that may deploy upon that aft portion of the countermeasure cartridge clearing the launch tube to assist in the desired flight characteristics of the countermeasure cartridge. [p. 7, ll. 4-7]. The launch tube, and thus the countermeasure cartridge, is rotated into position and the canard is set so that the non-rotating countermeasure cartridge tips over to its pre-set azimuth after launch. [p. 24, ll. 4 - p. 25, l. 2] Between the nose 51 and the payload section 54 of the countermeasure cartridge 50 is the first canard 64 and a second canard 64 disposed on an opposing side of the countermeasure cartridge 50. These canard(s) 64 may be characterized as airfoils that are at least generally disposed more toward the nose 51 of the countermeasure cartridge than toward the tail 53. At least one of these canard(s) 64 is preferably equipped with an appropriate mechanism 65 to enable the canard 64 to be folded down in what may be characterized as an inactive position and to be flipped out in what may be characterized as an active position in which the canard 64 can actively assist in controlling, facilitating, or at least generally affecting the flight of the countermeasure cartridge 50. [p. 17, ll. 1-12].

The countermeasure system 12 includes at least one launch assembly 20, at least one countermeasure cartridge 50, and what may be characterized as a rotation inhibitor for substantially preventing rotation of the countermeasure cartridge 50 relative to the launch tube 24 when the countermeasure 50 is disposed within the launch tube 24. The rotation inhibitor here refers to a combination of at least one guide key 68' (e.g. protrusion, projection,

outcropping or the like) associated with the countermeasure cartridge 50' and at least one keyway 76' (e.g. groove, channel, or the like) defined in the launch tube 24'. [Figure 5; p.22, ll. 9-11; p. 20, ll. 7-16] A length 84 of the keyway 68 (76') is preferably substantially parallel to the reference axis 26 when the countermeasure cartridge 50 is disposed within the launch tube 24. [p. 20, ll. 7-16].

Due to this preferred design of the countermeasure system 12, the countermeasure cartridge 50 is at least generally forced to rotate along with the launch tube 24 at least in one of the general directions indicated by arrow 88 about the reference axis 26. Another way of stating this would be to state this preferred design of the countermeasure system 12 at least generally prevents significant independent rotation of the countermeasure cartridge 50 relative to the launch tube 24. [p. 21, ll. 4-11]. This rotation inhibitor achieves what may be characterized as the zero-twist rifling feature of the countermeasure cartridge relative to the launch tube. [p. 23, ll. 11-12].

The countermeasure cartridge 50 of Figure 2 may also include an onboard gyroscopic stabilization system 71. This onboard gyroscopic stabilization system preferably at least generally assists in controlling one or more of the pitch, roll, and yaw of the countermeasure cartridge 50 after launch of the same. This is accomplished at least in part by the onboard gyroscopic stabilization system 71 at least indirectly providing signals to the mechanism 65 that controls the movement and the orientation of the canard 64 to thus cause the position of the canard 64 to change as necessary to maintain the desired flight path. [p. 18, l. 20 - p. 19, l. 4].

Between the payload section 54 and the nose 51 of the countermeasure cartridge 50 of Figure 3 is an appropriate control module 56. The control module 56 preferably includes

an appropriate microprocessor control unit 61, one or more appropriate canard control modules 63, and at least one timing device 67. Moreover, as an optional feature, the countermeasure cartridge 50 may include one or more supplemental thrusters 72 disposed toward the nose 51 of the countermeasure cartridge 50. [p. 17, ll. 13-18]. The supplemental thrusters may enable alteration and/or maintenance of a flight path of a countermeasure cartridge after launch. [p. 7, ll. 13-15].

An appropriate sensor system of the marine vessel 10 preferably generates data on a variety of factors utilized to generate predetermined flight parameters for the countermeasure cartridge 50 including, but not limited to, the velocity and direction of the marine vessel 10, the velocity and direction of the incoming threat, sea conditions, and wind conditions. The marine vessel's computer system may then calculate flight parameters and launch timing and then launch the countermeasure cartridge 50 based on such factors. The predetermined flight parameters preferably relate to the control module 56 of the countermeasure cartridge 50 as shown in step 104. [Figure 6].

The launch tube 24 of the countermeasure system 12 may be rotated about its longitudinal reference axis 26 in response to the predetermined flight data received by the control module 56 and/or independent launch timing and/or launch azimuth signals conveyed to the launcher assembly 20. This rotation of the launch tube 24 may generally be said to affect a launch azimuth of the countermeasure cartridge 50. For example, the rotation of the launch tube 24 may at least assist in aiming the countermeasure cartridge 50 so that, once launch and tip over (initial pitching utilizing the canard 64) have occurred, a direction of flight of a countermeasure cartridge 50 is preferably in agreement with the parameters computed by the marine vessel's computer system. This feature and combination with the control module 56 and the

predetermined flight parameters therein enables the countermeasure cartridge 50 to be effectively launched and flown without the use of a GPS radar or other conventional guidance package. [p. 24, ll. 4 - p. 25, l. 2].

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The drawings are objected to under 37 CFR 1.83(a) because the releasable decoy is omitted from the drawings.

Claims 44 and 46 through 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Becker (U.S. Patent No. 4,662,265), Gassler (U.S. Patent No. 4,681,014), Grosso (U.S. Patent No. 5,425,514), and Finkelstein (U.S. Patent No. 3,245,318).

Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Becker, Gassler, Grosso, and Finkelstein (U.S. Patent No. 3,245,318), as applied to claim 44, and in further view of Null (U.S. Patent No. 4,149,166).

ARGUMENT

Objection to the Drawings

The drawings were objected to under 37 CFR 1.83 (a) because they did not show the releasable decoy. Figure 3 has been amended to show a releasable decoy 54'. This amendment was electronically filed on December 19, 2006 and is currently pending. No new matter has been added by this amendment. The releasable decoy is disclosed in the specification, but was previously not shown. [*See* p. 16, ll. 16.].

Grouping of Claims

For each ground of rejection which appellant contests herein which applies to more than one claim, such additional claims, to the extent separately identified and argued below, do not stand or fall together.

Rejection of Claims 44 and 46 through 53 under 35 U.S.C. 103(a)

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations." MPEP 706.02(j). A *prima facie* case of obviousness has not been made and Appellant respectfully requests that this Board overrule the rejection of these claims.

The Cited Prior Art Does Not Teach or Suggest All Claim Limitations

The prior art cited by Examiner does not teach or suggest all claim limitations of the present invention as required for a rejection under 35 U.S.C. 103(a). Contrary to the assertion in the office action, Becker does not disclose a means for rotating the launch tube about its axis for training the countermeasure cartridge in azimuth while disposed on the base. [Office Action Mailed September 1, 2006, p.4]. Becker discloses a system for horizontally orienting (aiming) a rotatable weapon's platform. [col. 1, ll. 31-42]. In Becker, the base rotates around the central axis of the base, not around the central axis of the tube. [*See* Figs. 1- 2; col. 2, l. 63 - col. 3, l. 4; col. 4, ll. 19-22]. In other words, the weapon in Becker must include a means for rotating the weapon's ***base around the axis of that base***. Becker refers to a weapon 5 which may have a "tube" such as the barrel of a howitzer or cannon. The weapon 5 may rotate about the axis 11 of the base 9 when the tube is in the clamped position and the base is being adjusted, but the tube itself does not rotate about its own axis. [col. 4, ll. 1 - 9]. Appellant's invention is entirely different because it includes the limitation of a means for rotating the launch tube about ***the launch tube's axis*** in order to train the countermeasure cartridge in azimuth. Examiner has

pointed to no individual reference or combination of prior art references disclosing this limitation.

Additionally, none of the references cited disclose a system for vertically launching a countermeasure cartridge which is trained ***only*** in azimuth. Examiner also relies on Becker to teach this limitation. [Office Action Mailed September 1, 2006, p. 4]. Again, Becker discloses a system which allows a weapon base to be quickly, horizontally maneuvered so that the mounted weapon will be pointing in the desired direction. [col. 5, ll. 20-25]. Becker does not teach anything regarding the orientation of a launch tube; its teachings are limited to the horizontal orientation of a weapon's base. Further, the projectiles in the present invention, the countermeasure cartridges, are self-propelled, meaning they have a propulsion module, such as a rocket motor, that exhibits a comparatively slow burn to effect movement. [p. 15, ll. 16 - 17]. The system in Becker is a rotatable base designed for use with fired projectiles such as howitzers or cannons. [*See* col. 1, ll. 8 - 28]. Weapons utilizing fired projectiles use gun powder to propel the projectile from the tube and on its course. Those skilled in the art recognize that fired projectiles are not vertically launched.

No prior art cited discloses a countermeasure cartridge having a guide key cooperable with the tube longitudinal keyway said guide key and said keyway being disposed for interaction to effect non-rotational axial movement throughout a substantial portion of the launch such that the countermeasure cartridge remains trained in azimuth. Examiner asserts that Finkelstein "teaches a launcher comprising a guide and a groove attached to the missile to prevent rotation of the projectile during the launching stage." [Office Action Mailed September 1, 2006, p. 5]. Finkelstein discloses a missile launcher with guide rails and a guide track that prevents rotation of the missile during the launch stage. [col. 3, ll. 35-45]. It discloses a

flotation missile launcher designed for launching a missile from a body of water so that the missile is easily handled and serviced while waterbourne. [col. 1, ll. 15-18]. Finkelstein's missile launcher is not trained in azimuth for its launch course, and discloses no means to train the missile by rotating a launch tube. Finkelstein discloses no means to aim the missile at all. Logically, since the missile of Finkelstein is not trained in azimuth, it can not remain trained in azimuth during the launch. None of the other references identified disclose a countermeasure cartridge that remains trained in azimuth during launch as described in the present invention.

Because the prior art cited by Examiner does not teach or suggest all claim limitations of the present invention; Applicant's invention should not have been rejected as obvious and the Board should overrule the rejection.

There is No Suggestion, Motivation or Teaching to Combine the Cited Prior Art to Produce the Present Invention

The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985); MPEP 706.02(j). Here, the Examiner has not met the initial burden; therefore, the obviousness rejection should be overruled.

It is suggested it would have been obvious to a skilled artisan to combine Becker and Gassler to produce a "launcher that had decreased rotational movement during on-loading of

the missile in order to decrease cable winding[1] and increase precision." [Office Action Mailed September 1, 2006, p.5]. Becker is described above. [*See supra*, pp. 10-11]. Gassler is directed to a guide system for preventing rotation of a missile during on-loading in a launching tube while permitting a controlled translation of the missile in the launching tube when subjected to external seismic shocks. [col. 5, l. 47 - col. 6, l. 2]. The alignment is only functional during the loading process. [*See* col. 3, ll. 15 - 42]. The missile rests on top of a missile support ring which is attached to the guide system and mounted to the silo or other such device. [*See* Figure 2; col. 4., l. 20 - col. 5., l. 30]. Gassler's "loading" guide system is not interconnected to the missile so as to operate in guiding it during launch.

There is no motivation to combine Becker and Gassler. First, Becker discloses a system for aiming a weapon's platform, not for decreasing the rotation of a launcher; therefore, Becker could not have provided the stated motivation. Second, the combination of Becker and Gassler is illogical. There is no need for a base to horizontally orient a missile launched from a silo. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti,* 270 F.2d 810, 123 USPQ 349 (CCPA 1959); MPEP 2143.01. The combination of Becker and Gassler would change the principal of operation of both those inventions; therefore, the combination can not be relied upon to render the present invention obvious.

Third, the stated motivation does not describe applicant's invention. Applicant's invention fixes the countermeasure cartridge in the launch tube via a keyway and guide key, allows rotation of the tube about its axis to train the countermeasure cartridge in only azimuth,

[1] Cable winding occurs during loading of a missile into a launch tube.

then provides for non-rotational axial movement throughout the launch such that the countermeasure cartridge remains trained in azimuth. It does not teach a launcher that has decreased rotational movement during on-loading of the missile in order to decrease cable winding[2] and increase precision. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990); MPEP § 2143.01 The Examiner has not provided a convincing line of reasoning as to why a skilled artesian would have combined Becker and Gassler; therefore, the obviousness rejection should be overruled.

Examiner states that it would be obvious to combine Becker, Gassler, and Finkelstein. [Office Action Mailed September 1, 2006, p.5]. There is absolutely no suggestion or motivation to combine Finkelstein, directed to a waterbourne, flotation missile launcher, with Becker, directed to missile launch platform which attaches to vehicles, and Gassler, directed at missile launching from large silos "to obtain a system that prevents rotation of the missile during launching." [Office Action Mailed September 1, 2006 p.5]. The guide system in Finkelstein prohibits rotation during launch so that the fins of the missile do not become entangled with the support structure. Finkelstein's missile launcher is not trained in azimuth for its launch course, and discloses no means to train the missile by rotating a launch tube. There are no teachings in Finkelstein regarding any sort of aiming of the missile. The invention is limited to the construction of the launch platform. [*See supra* p. 11 for a detailed description of Finkelstein].

The apparatus which comprises the invention in Gassler is attached to a support ring. The missile is attached to the support ring and lowered into the silo without rotation so that

[2] Cable winding occurs during loading of a missile into a launch tube.

it can be properly positioned in the silo. The apparatus and the support ring stay in the tube when the missile is fired. They have no function during the launch. In fact, "[t]he missile [in Gassler] and its longitudinal support assembly are [] free to move in all planes in the launching tube" after the missile is loaded into the tube. [col. 5, ll. 28-30]. Applicant's invention effects non-rotational axial movement during launch such that the countermeasure cartridge remains trained in azimuth. Neither Finkelstein, Becker, nor Gassler, together or separately, suggest that limitation nor provide any teaching or motivation to be combined to create Applicant's invention.

Examiner states that combination of Becker, Gassler, Finkelstein and Grosso discloses the "decoy cartridge having a canard means and the specific control means" of Applicant's invention. [Office Action Mailed September 1, 2006, p.5]. Examiner identified the suggestion or motivation for this combination as "to obtain a defense system that had a higher probability of hitting the target." [*Id.* at p.6].

Grosso relates to "artillery or gun systems" that utilize spin-stabilized projectiles "with the ability to hone in on a target." [col. 1, ll. 11-14]. Grosso teaches an offensive system which increases the probability that the spin-stabilized projectile will hit its target. [col. 3, ll. 22-34]. Those skilled in the art recognize that spin-stabilized projectiles are fired projectiles as discussed *supra* with respect to Becker. Grosso does not relate to self-propelled missiles such as those utilized in the countermeasure system of the present invention. The countermeasure system of the present invention is purely a diversionary defense system. The countermeasure cartridges are deployed to redirect an incoming projectile. They are aimed quickly with little regard for precision. There is no suggestion to combine these references because the prior art cited does not suggest that such a combination would be desirable. *See In re Mills*, 916 F.2d

680, 16 USPQ2d 1430 (Fed. Cir. 1990); MPEP § 2143.01. The probability of hitting the target is not important to the present invention relating to diversionary countermeasure systems, therefore, one skilled in the art would not have found any motivation to combine the cited references.

Moreover, the canards employed by Grosso are designed for spin-stabilized (i.e. rotating) projectiles. [col.5, l. 65 - col. 6, l. 8]. The canards used for self-propelled missiles such as the countermeasure cartridges utilized in Applicant's invention to tip the non-rotating cartridge over to its pre-set azimuth are entirely different.

There is no suggestion, motivation, or teaching in the prior art cited by examiner to combine Becker, Gassler, Finkelstein and Grosso to produce Applicant's invention; therefore, the rejection should be overruled.

The Cited Prior Art Does Not Render the Present Invention Obvious Because It Is Non-Analagous Art

The cited references are from non-analogous art. The Examiner states that the cited references are from analogous art because they all relate to defense systems. [Office Action mailed September 1, 2006 p.5, 6]. This is a broad categorization of the art. A wide variety of weaponry exists for defensive purposes. These weapons are designed in many different ways. Mechanisms and teachings in one defense system may be wholly unrelated and not applicable to mechanisms and teachings used to defend in another defense system.

For example, the system in Becker provides a weapon platform for howitzers, mortars, and anti-aircraft weapons, which are well known not to be vertically trained. These weapons handle fired projectiles, meaning an explosion occurs in the tube which propels the projectile out of the tube. Further, such weapons exhibit rifled barrels for firing spin stabilized projectiles. Similarly, Grosso is directed to a spin stabilized guidance system which is an

onboard control system used to control flight path. These types of onboard systems are not an integral part of Applicant's invention. Grosso is directed to sensing the operating parameters of a spin stabilized projectile and, other than mentioning a canard, has no relevance to the present invention.

The present invention is directed to a spin free missile, including a guide track and key means to ensure no rotation. The countermeasure cartridge is self-propelled meaning that it utilizes a propulsion module, such as a rocket motor, that exhibits a comparatively slow burn, as compared to gun powder, to propel the projectile from the tube and on its course. It is a system totally unrelated to Becker as to launch and control.

Both Gassler and Finkelstein relate to launch platforms. Gassler provides an apparatus and mechanism to orient a missile in a silo. Finkelstein discloses a waterbourne launch platform. Neither reference teaches anything regarding aiming or training the missile. Those skilled in the art recognize that these platforms are designed for weapons with sophisticated, on-board controls systems. This is very different subject matter than the simple countermeasure system disclosed in the present application.

The cited references are non-analogous art, and cannot be relied upon for an obviousness rejection; therefore, Examiner's rejection should be overruled.

Rejection of Claim 54 under 35 U.S.C. 103(a)

There is No Suggestion, Motivation or Teaching to Combine the Cited Prior Art to Produce the Present Invention

Null discloses a sophisticated Doppler countermeasures system. It teaches a decoy that exhibits the same Doppler effect as the target thus re-targeting an enemy Doppler seeker. [col. 1, ll. 8 - 16]. The Doppler Effect is "[t]he difference between the frequency of a wave (as of sound or light) as measured at its source and as measured by an observer in relative

motion. The Doppler effect can be used to determine the relative speed of an object by bouncing a wave (usually a radar wave) off the object and measuring the shift in the frequency of the wave." THE AMERICAN HERITAGE SCIENCE DICTIONARY, Houghton Mifflin Company, last viewed on 19 Dec. 2006 at <Dictionary.com http://dictionary.reference.com/browse/doppler effect>. This principle is used in offensive defense weaponry to track and intercept incoming missiles and destroy them before they reach their targets.

The motivation to combine Null with the other references is identified as "to obtain a system that was effective for protection against Doppler attacks." [Office Action mailed September 1, 2006 p.6]. First, Applicant's invention discloses a countermeasure system for vertically launching a countermeasure cartridge trained only in azimuth. Nothing in the current application suggests the use of the Doppler effect. It is a simple, diversionary system. In contrast, the Doppler countermeasure device disclosed in Null is very complex decoy system. Second, there is no such phenomenon as a Doppler attack. Some sophisticated offensive missiles use Doppler radar (radar based on the Doppler effect) to track and target moving objects. There is nothing in Null suggesting a combination with the other cited references would be desirable.

The Examiner has not presented a convincing line of reasoning as to why a skilled artesian would have combined Becker, Gassler, Finkelstein, Grosso and Null and has not met the burden of establishing a *prima facie* case of obviousness. Additionally, this combination does not produce the claimed invention. Finally, there is no suggestion, teaching or motivation to combine Finkelstein, Becker, Gassler, Grosso, and Null. The claim rejections should be overruled.

Conclusion

Applicant's invention allows for vertical launch of a countermeasure cartridge trained only in azimuth by placing the countermeasure cartridge in the vertical launch tube which

is then rotated about its own axis to train the countermeasure cartridge in azimuth. The countermeasure cartridge is held in place during launch by a keyway in the tube which fits a key on the missile. All elements of Applicant's invention are not disclosed in the cited references. Moreover, there is no suggestion, teaching or motivation to combine the cited references to create Applicant's invention. Finally, the cited references are from non-analogous art. For these reasons, Applicant asserts that the obviousness rejection is improper and respectfully requests that this Board overrule the Examiner and allow the claims.

Respectfully submitted,

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Date: March 13, 2007

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March 13, 2007

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CLAIMS APPENDIX

Claims 1 - 10 and claims 11 - 43 and 45 (canceled)

44.(previously amended) A countermeasure system for vertically launching a countermeasure cartridge trained only in azimuth comprising:

a base for supporting the system;

a launch tube having a central axis, the tube being disposed substantially vertically on the base, the tube having a zero twist longitudinal keyway therein for effecting non-rotational, axial movement relative thereto;

means for rotating the launch tube about its axis for training the countermeasure in azimuth while disposed on the base;

a countermeasure cartridge receivable within the tube, having propulsion means for launching the cartridge longitudinally out of the tube along its axis;

the countermeasure cartridge having a guide key cooperable with the tube longitudinal keyway said guide key and said keyway being disposed for interaction to effect non-rotational axial movement throughout a substantial portion of the launch;

the countermeasure cartridge having a canard disposed thereon for adjustment of the pitch of the cartridge during flight after launch from the tube.

45.(canceled)

46. (previously added) The countermeasures system as claimed in claim 44 wherein the launch tube is housed in an outer tube affixed to the base.

47. (previously amended) The countermeasures system as claimed in claim 44 wherein the tube longitudinal keyway and the countermeasure cartridge guide key provide for rotation-free launch of the countermeasure cartridge with respect to the launch tube.

48. (previously amended) The countermeasures system as claimed in claim 47 wherein the rotation of the launch tube sets the launch azimuth orientation and course of the countermeasure cartridge and the actuation of the canard statically adjusts pitch angle and ballistic trajectory of the countermeasure cartridge.

49. (previously amended) The countermeasures system as claimed in claim 44 includes a thruster disposed substantially perpendicular to the axis of the countermeasure cartridge for selective adjustment of the course of the cartridge after launch from the launch tube.

50. (previously amended) The countermeasures system as claimed in claim 49 wherein the countermeasure cartridge includes internal control means preprogrammed for activation of the thruster.

51. (previously amended) The countermeasures system as claimed in claim 44 wherein the countermeasure cartridge includes internal control means preprogrammed for activation of the canard.

52. (previously amended) The countermeasures system as claimed in claim 44 wherein the countermeasure cartridge includes an onboard gyroscopic stabilization system to control at least one of roll, pitch and yaw of the countermeasure cartridge after launch.

53. (previously amended) The countermeasures system as claimed in claim 52 wherein the gyroscopic stabilization system is linked to a data base prior to launch of the countermeasure cartridge whereby updated flight and countermeasure information is provided to the system.

54. (previously added) The countermeasure system as claimed in claim 44 wherein the countermeasure cartridge contains a releasable decoy.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.